

REMARKS

Reconsideration of this application and withdrawal of the rejections set forth in the Office Action made final mailed March 22, 2011 (the "Office Action"), is requested in view of the amendments above and the following remarks. A Request for Continued Examination is being filed concurrently with the paper, thereby removing the finality of the outstanding Office Action. Prior to this amendment, claims 29, 30 and 70-95 were pending and at issue. By this amendment, claims 29 and 95 have been amended herein, and new claim 96 has been added. The claims as amended, and new claim 96 are fully supported by the original specification as filed and no new matter has been added. For example, the kit claim of 96 is supported at least at pages 45-46 of the specification as filed.

I. Previous Objections and Rejections

Applicant gratefully acknowledges that Examiner's indication that the previous objection to the drawings, and the previous rejections under 35 U.S.C. § 112 have been withdrawn.

II. Obviousness Rejections under 35 U.S.C. Section 103

Thus, the only pending rejections of in the Office Action are the rejections under 35 U.S.C. section 103(a), as follows:

Claims 29, 30, 70-80, 94 and 95 stand rejected under 35 U.S.C. section 103(a) as being obvious over Thunnissen et al. (WO 03/087829), in view of GenBank GI:60955 [online] July 6, 1989 [retrieved on July 3, 2010] retrieved from:

<http://www.ncbi.nlm.gov/sviewer/viewer.fcgi?val=60955&sat=OLDID&satkey=34726>
(hereafter, "GenBank GI:60955).

Claims 81-83 stand rejected under 35 U.S.C. section 103(a) as being obvious over

Thunnissen et al., in view of GenBank GI:60955, and further in view of Amundson et al. (WO 00/50643).

Claims 84-86 stand rejected under 35 U.S.C. section 103(a) as being obvious over Thunnissen et al., in view of GenBank GI:60955 and Amundson et al., and further in view of Fodor et al. (U.S. Patent Appn. Publ. No. 2003/0186296).

Claims 87 and 88 stand rejected under 35 U.S.C. section 103(a) as being obvious over Thunnissen et al., in view of GenBank GI:60955, Amundson et al. and Fodor et al., and further in view of Walkerpeach et al. (U.S. Patent Appn. Publ. No. 2001/0006800).

Claims 89-91 stand rejected under 35 U.S.C. section 103(a) as being obvious over Thunnissen et al., in view of GenBank GI:60955, and further in view of Sabath et al. (U.S. Patent Appn. Publ. No. 2003/0175761).

Claim 92 stands rejected under 35 U.S.C. section 103(a) as being obvious over Thunnissen et al., in view of GenBank GI:60955, and further in view of Neefe et al. (U.S. Patent Appn. Publ. No. 2003/0170268).

Claim 93 stands rejected under 35 U.S.C. section 103(a) as being obvious over Thunnissen et al., in view of GenBank GI:60955 and Neefe et al., and further in view of Maas et al. (PNAS 96:8895-8900, August 1999).

Applicant has amended claim 29 to further limit the oligonucleotide or nucleic acid molecule to one selected from the group consisting of SEQ ID nos. 8-9, 11, 14, 18-20, 23-24, 30, 32-34, 36-39, 41-43, 45-46, 49, 53, 55-58, 61-66, 69, 72, 74, 81, 87, 92, 95-96, 100-101, 105, 107-108, 110-114, 116-118, 122, 124-126, 128, 130, 132, 133, and 135. These particular SEQ ID nos. provide the advantage that they all have a GC-content within a narrow range, namely

between 30% and 36.67%, as shown in Table 1 of Exhibit 1 attached hereto. The GC-content of a probe directly influences the melting temperature (Tm) of the probe, and consequently the binding strength. The range of GC-content of the probes of claim 29 is only 6.67% and the relative standard deviation of the GC-content of the probes of claim 29 is 7.4%, i.e. a very narrow range (see Table 1 of Exhibit 1). The use of probes only within this narrow range of melting temperatures (Tm) provides the advantage that for a given stringency of hybridization buffer, the binding strength of the probes will be almost identical, thereby also giving similar detection limits.

In marked contrast, the probes of Thunnissen et al. have a significantly wider range of GC-content that ranges from 20% to 60%, as shown in Table 2 of Exhibit 1 attached hereto. As shown in Table 2, the range of GC-content for the probes of Thunnissen et al. is 20%, and the relative standard deviation is 26.0%. This wide range of melting temperatures results in probes having widely varying binding strengths and widely varying detection limits, in comparison to Applicant's claimed invention.

There is no teaching or suggestion in Thunnissen et al., or the other cited prior art, to select the group of probes having a narrow range of GC-content, as set forth in Applicant's claimed invention. Even if one of ordinary skill in the art would have understood that alternative regions of the E1 gene than those used by Thunnissen et al. could be used, there is no teaching or suggestion to configure the probes to have the narrow range of GC-content, as utilized in Applicant's claimed probes. Accordingly, Applicant's claimed invention is not obvious over Thunnissen et al. in view of the other cited prior art.

Furthermore, Applicant's claimed probes have a significantly greater length than the

probes of Thunnissen et al. The probes of Thunnissen et al. consist of two parts. The first part is a non-specific spacer of 15 nts having the sequence: TTTTCTTTCTTTTC. The first part is followed by the specific part having 20 nts. In contrast, the probes of the present invention as recited in claim 29 have a specific part of at least 26 nts, and most have greater than 30 nts (see Table 1). The longer probes of Applicant's claimed invention will inherently bind stronger to the desired target and therefore the detection will be more sensitive. As with the GC-content, there is no teaching or suggestion to modify Thunnissen et al. to utilize the longer probes of Applicant's claimed invention. Therefore, there is less a risk of non-specific binding for longer probes. The probability that a human DNA (which will be present in an application) will bind by chance is the smaller the longer the probe. Again, even if one of ordinary skill in the art would have understood that alternative regions of the E1 gene than those used by Thunnissen et al. could be used, there is no teaching or suggestion to utilize probes having a greater length than those taught by Thunnissen et al. Thus, for this additional reason, Applicant's claimed invention is not obvious over Thunnissen et al. in view of the other cited prior art.

Moreover, there is no teaching or suggestion in Thunnissen et al. or the other prior art to utilize this innovative combination of a narrow range of GC-content and a greater length probe, as provided in Applicant's claimed invention. There is simply no teaching or suggestion in Thunnissen et al. or the other prior art to modify the probes of Thunnissen et al. to have the claimed features of Applicant's invention, namely the probes having a narrow range of GC-content, and a minimum length of 26 nts. While the claims do not explicitly recite the GC-content and minimum nucleotide length, the claimed SEQ ID nos. inherently include these limitations.

Accordingly, independent claim 29 is not obvious over Thunnissen et al., in view of the other cited prior art. Claims 30 and 70-95 depend from claim 29, or an intervening claim, and are not obvious over Thunnissen et al., in view of the other cited prior art, for at least the same reasons applicable to claim 29. Thus, all of the obviousness rejections should be withdrawn.

New claim 96 adds the additional limitation that the probe of claim 1 is combined, in a kit, with a primer selected from the group set forth in claim 96. There is no teaching or suggestion in Thunnissen et al., or the other cited prior art, to combine the probe of claim 1, in a kit with the primer of claim 96. Applicant's claimed primers differ significantly from the primers of Thunnissen et al. For example, Applicant's claimed primers can be used in a mix in a single reaction (see Example 1), instead of the multiple type specific reactions taught by Thunnissen et al. Therefore, claim 96 is not obvious over Thunnissen et al. for these additional reasons.

Conclusion

Any claim amendments which are not specifically discussed in the above remarks are not made for reasons of patentability, do not affect the scope of the claims, and it is respectfully submitted that the claims satisfy the statutory requirements for patentability without the entry of such amendments. These amendments have only been made to increase claim readability, to improve grammar, or to reduce the time and effort required of those in the art to clearly understand the scope of the claim language.

In view of the foregoing remarks, Applicant respectfully submits that all of the Examiner's rejections have been overcome. Accordingly, allowance is earnestly solicited. If the Examiner feels that a telephone interview could expedite resolution of any remaining issues, the Examiner is encouraged to contact Applicant's undersigned representative at the phone number

listed below.

Respectfully submitted,

Dated: September 22, 2011 By: /James K. Sakaguchi/
James K. Sakaguchi
Reg. No. 41,285

Vista IP Law Group LLP
2040 Main St. Suite 710
Irvine, California 92614
Telephone: 760-803-5967
Facsimile: 949-625-8955